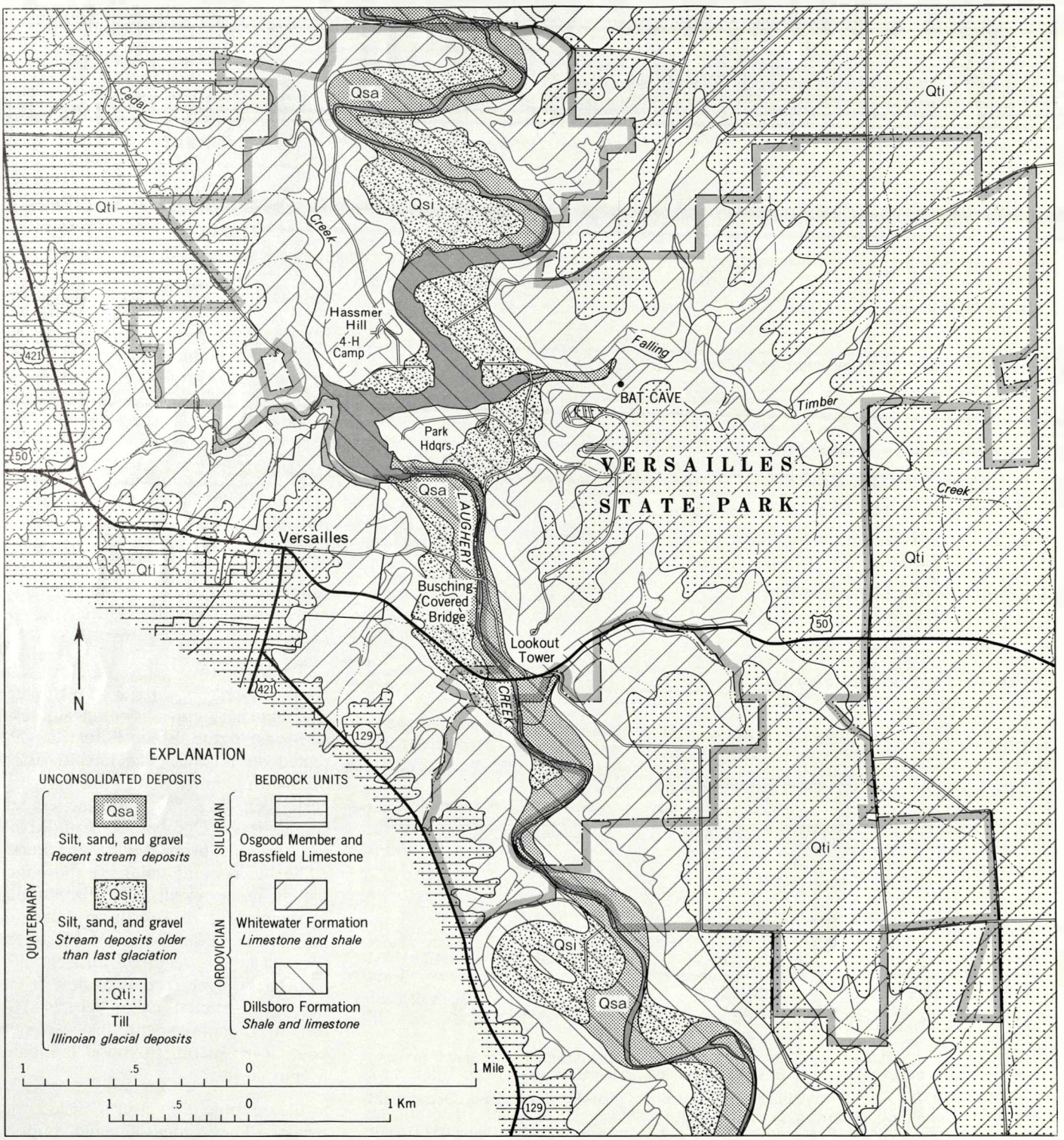
Outdoor Indiana
October 1975

State Parks (Ind.)



This Geologic Map of Versailles State Park Shows Bedrock Units and Glacial and Stream Deposited Material.

VERSAILLES PARK Where History, Geology and Nature Meet

By Carl B. Rexroad
Indiana Geological Survey

Lochry, Lochrey, Loughry, Loughrey, Laughery.

No matter how you spell the name, Laughery Creek and its steep-walled valley dominate Versailles State Park.

Versailles joins its sister State Parks in featuring natural beauty and natural history. Its geologic features add to its interest and popularity.

Versailles State Park with 5,897 acres is Indiana's second largest. The tract was deeded to the State in 1943 by the National Park Service. Earlier under the Emergency Conservation Work Program the NPS purchased all the land, drew up plans for development, and supervised work by the Civilian Conservation Corps. Construction and improvement by the Division of State Parks of the Indiana Department of Natural Resources have continued in the ensuing three decades. Versailles Lake is one of the notable additions by the State.

In my visits to the Park two mysteries quickly emerged. Both concern Laughery Creek. One is the history of the naming of the creek; the other involves its geologic history. The latter mystery, I am confident, will be solved as more detailed investigations are made.

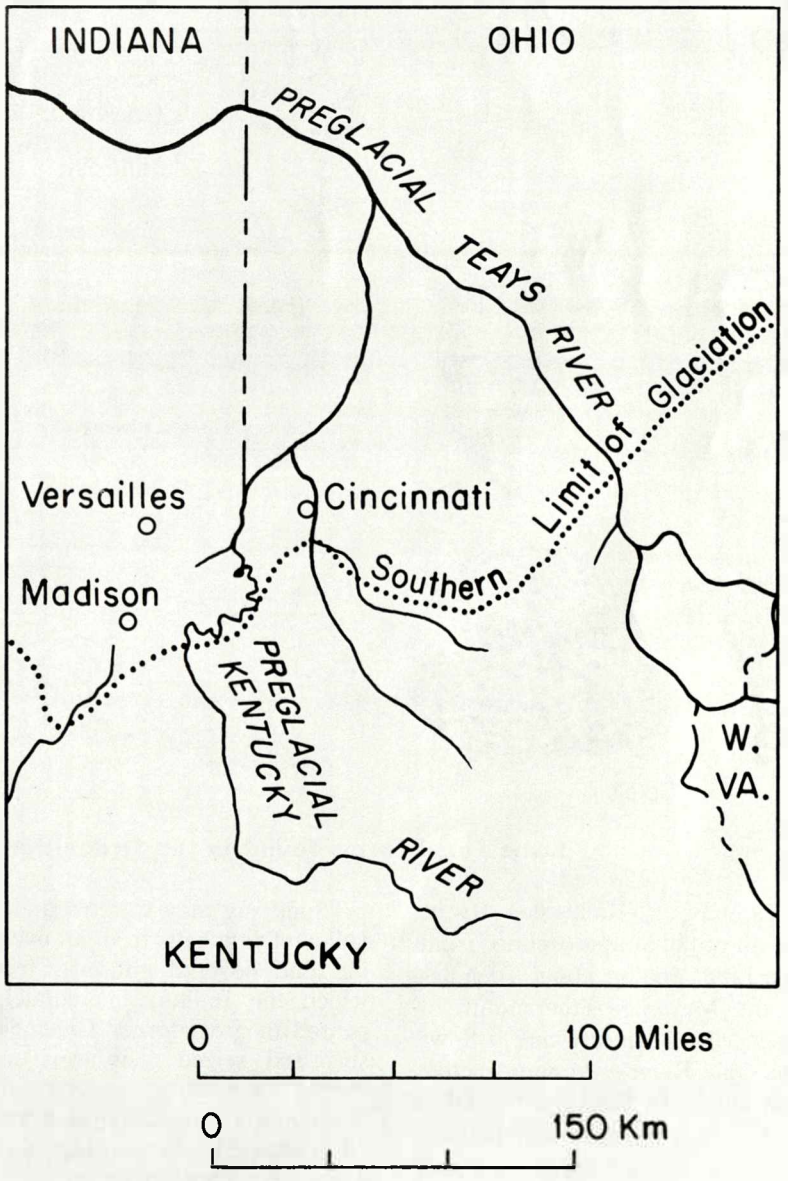
The first mystery is one of spelling. Why is a stream that is named after the Revolutionary War soldier, Col. Archibald Lochry, called Laughery Creek? Perhaps that isn't too unusual because several different spellings have been used for the Colonel's name by one person or another.

Even though it is a misnomer, the spelling *"Laughery"* for the famous soldier from Hannastown, Pa., has been applied to the stream for so long and so consistently and appears on so many different types of maps that it is now accepted as the correct name of the creek.

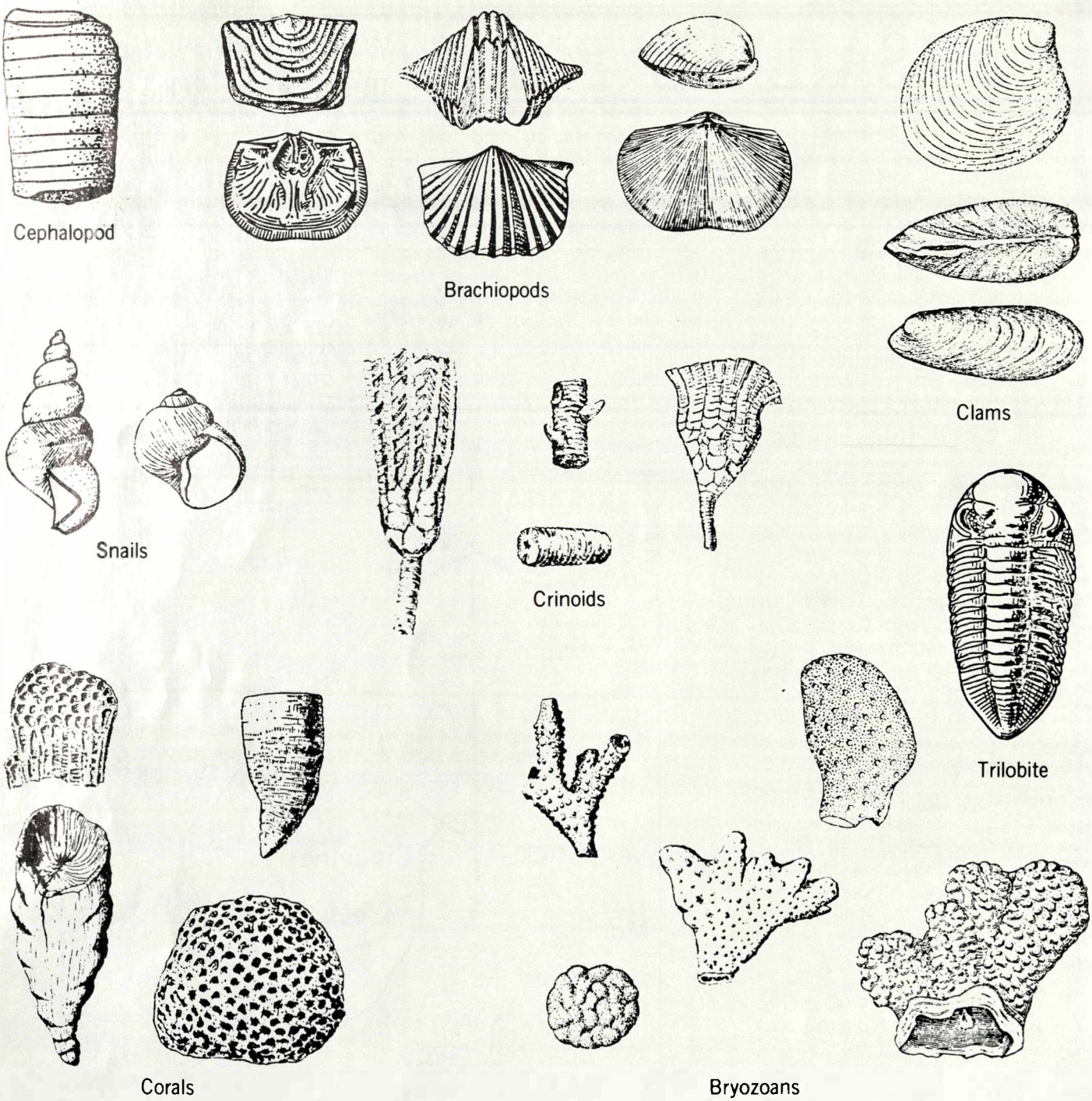
The naming of Laughery Creek stems from the first recorded *battle* between the Indians and whites in what is now Indiana. The story bears repeating even though it is not of direct geologic interest. A brief version, in fact, was given in *The Geology of Ripley County*, published in 1876 in the *Seventh Annual Report of the Geological Survey of Indiana.* [See *Outdoor Indiana,* June, 1971; May and October, 1974.]

In the Summer of 1781 a force of 107 men under the command of Col. Archibald Lochry from Westmoreland County, Pa., moved to join Col. George Rogers Clark in a military move against the Indian tribes of the Northwest, which were fighting with the British during the *Revolution.* The two commands were supposed to join forces at Wheeling Fort (now Wheeling, W.Va.). And then, when they missed connections there, they were to attempt a rendezvous at several subsequent points downstream.

Left with few provisions and little ammunition, Lochry's troops moved down the Ohio River, always remaining behind Clark as they passed the



Rivers in Southeastern Indiana and Adjacent Areas Before the Glaciers Changed Their Flow.



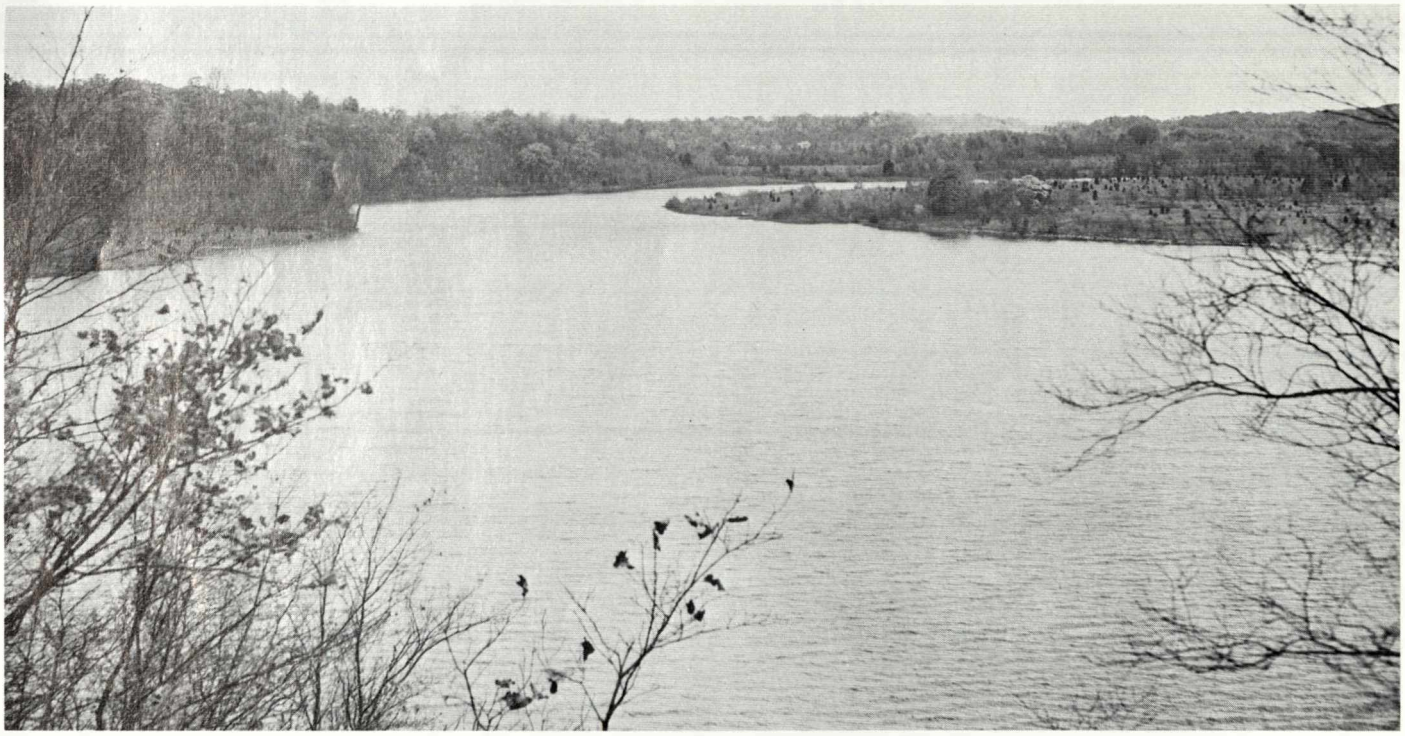
Some Fossil Forms Found in the Ordovician Rocks at Versailles.

Little Connaway (Kanawha) River, the mouth of the Siotha (Scioto), and on to a fatal landing about 10 miles below the Meyamee (the mouth of the great Miami River where it flows into the Ohio River). At an attractive spot on the right bank of the Ohio at the mouth of a creek, they landed, brought their horses ashore to graze, and began preparing a buffalo killed by one of the party.

"Suddenly they were assailed by a volley of rifle balls from an overhanging bluff, covered with large trees, on which the Indians immediately appeared in great force. The men thus surprised, seized their arms and defended themselves as long as their ammunition lasted, and then attempted to escape by means of their boats." They were fired on by another party in canoes and were compelled to surrender.

Immediately the Indians massacred Col. Lochry and several other prisoners. They were restrained from further slaughter by Joseph Brant, the Mohawk chief who commanded them. He had arrived on the Ohio River after a rapid trip from New York State. Thus the peaceful Laughery Creek that we know was baptized in blood.

You can almost think of this creek,



The Beautiful Rock-Lined Lake at Versailles State Park.

Laughery, as two separate streams. One segment flows nearly South through Ripley County; the other flows Northeastward, marking the Ohio-Dearborn County boundary, to the aforementioned spot where the creek joins the Ohio River. The present pattern of Laughery Creek depends on the type of rock over which it flows and on drainage changes brought about by great masses of glacial ice spreading across Indiana.

To set the stage for the cutting of the creek to its present position let us first examine the rocks exposed in the valley, for it is the rocks themselves that record past geologic events. To be complete the story of this State Park must interpret the history of both the bedrock and the loose glacial deposits resting on bedrock.

Obviously, bedrock is not everywhere actually exposed to view. But you will see many places where the cover of soil and vegetation has been stripped away to bare rock surfaces. For example, around the entrance to Bat Cave are ledges of limestone and thinner shaly layers of rock. Below Bat Cave layers of shale and thin beds of limestone have been exposed by gullying.

Because the rocks are layered and are tilted only slightly, it is relatively easy from the scattered exposures to work out the relationships between the different kinds of rock. The distribution of these bedrock units, called formations, is shown on the geologic map of Versailles State Park on Page 4. Also included on the map is the distribution of the rock material related to glaciation and stream development.

To determine the geologic age of the bedrock of Versailles State Park we need to turn to the fossils that make up part of the rock. For many years fossil hunters have known about the variety of fossils that you can find near Versailles. Brachiopods, Bryozoans, Corals, and Crinoid fragments are abundant, and Snails, Clams, Cephalopods, Stromatoporoids, and even Trilobites are part of the fossil population. A few examples are illustrated on Page 6 to show how diverse these ancient creatures were.

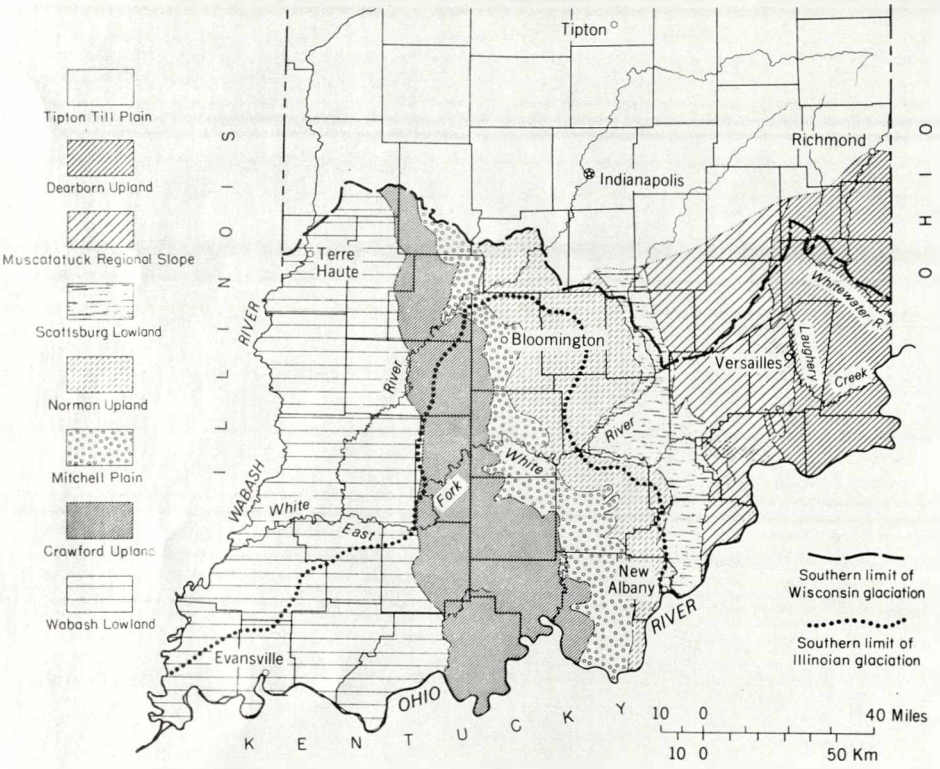
These fossils tell us first that the oldest rocks exposed in Versailles State Park date from the latter part of the *Ordovician Period* and the youngest from the early part of the *Silurian Period*. This is an interval of time roughly from about 450 to about 420 million years ago.

In addition to serving as a yardstick (or meterstick!) to measure geologic time, fossils are also important in interpreting ancient environments because the habitat in which any group of plants or animals can live is restricted.

The fossils thus show that the rocks in which they are now found were deposited at the bottom of shallow seas. Several hundred million years back in time the geography of what is now the United States was so vastly different from the present that it is hard to picture.

By locating all of the outcrops containing *Ordovician* marine fossils and by drilling through rock layers that may cover *Ordovician* rocks, we can reconstruct the limits of the *Ordovician* seas. Thus we know that the *Ordovician* sea covering the area that is now Versailles State Park also covered most of the Eastern United States from the Appalachian Mountains to Missouri and Iowa. An arm of this same sea extended to the Southwestern United States.

In the Midwest the time between the deposition of *Ordovician* and *Silurian* rocks was marked by withdrawal of the seas from the area. As



A Physiographic Map of Southern Indiana.

the former sea bottom was gradually warped upward just above sea level the exposed sediments were subjected to the same forces of destruction (weathering and erosion) that now gradually wear away the rocks.

Some of the youngest *Ordovician* rocks were removed from the record before the seas again advanced and the *Brassfield Limestone* of *Silurian Age* was deposited. But a narrow area in the Western part of Ripley County remained as an island above the encroaching tide as the seas readvanced.

The cycle of warping of the surface and migration of the sea was repeated many times for millions of years. As changes continued, the rocks of Southeastern Indiana were tilted up to the East and down to the West. The most recent interval of uplift occurred no more than a few million years ago. Added elevation gave added downcutting power to the streams, and great amounts of rock were stripped away, thereby creating the major landforms of Southern Indiana shown and named on the physiographic diagram.

Note that the boundary between the rugged *Dearborn Upland* to the East and the much flatter *Muscatatuck Regional Slope* follows Laughery Creek as it flows through the Park and for that matter in much of Ripley County. Even the smaller streams have cut deeply into the *Ordovician* rocks that are relatively easily eroded because they contain large amounts of shale.

Thus the *Dearborn Upland,* with much of its land in slopes, coincides generally with the extent of the *Ordovician* rocks.

On the other hand, the thick limestone and dolomite sequence of *Silurian* and *Devonian Age* comprising the *Muscatatuck Regional Slope* is relatively resistant to erosion. Only the larger streams have been able to cut deeply into these rocks. Much of the land remains as flat upland surface, regionally sloping in the same direction that the rocks are tilted, down to the *Scottsburg Lowland* formed on shale.

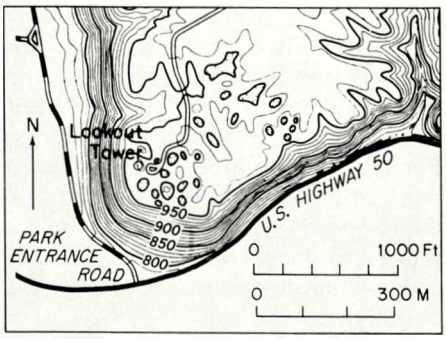
This, then, is the general landscape that would have met the eye before the *Ice Age* glaciers spread over Indiana. Except for the arrangement of drainage it was a scene for Southern Indiana not too different from the present.

As the glaciers moved from the North they picked up loose rock and soil and scraped, plucked and gouged out the bedrock, thus gathering huge masses of rock in the ice. As each ice advance ground to a stop and then began slowly melting back, all this rock material (boulders, cobbles, pebbles, gravel, sand and clay) was left behind. Some of the material *(till)* was dumped directly by the glaciers. Some *(outwash)* was carried away and reworked by meltwater pouring from the glacial front.

Only *till* is found in the Versailles State Park, where it forms a relatively thin veneer on the hills. Thus the modifications of the land surface by accumulating glacial debris was relatively minor, particularly when compared with the *Tipton Till Plain* to the North, where the previous landscape was buried by glacial material. Partly this is because ice of the last or *Wisconsin Age* glaciation did not creep as far South as the Park. Its greatest advance is marked on the physiographic diagram on Page 5.

Although Southern Indiana was not deeply buried by glacial debris, the regional drainage patterns were disturbed and markedly rearranged because of the ice and its deposits. Before the *Ice Age* a major river flowed Northward, and the lower segment of Laughery Creek apparently was a tributary to this river. The Ohio River, as we know it now, did not exist. However, a stream did start near present-day Madison, as the map on Page 5 shows.

As the glaciers advanced across Indiana the Northward-flowing streams were dammed. The ponded water rose higher and higher, forming tempo-



Concentration of Sinkholes in the Park.

rary lakes that eventually overflowed the divides. The overflow outlets were quickly cut down to form a line of drainage nearly parallel to the front of the ice mass.

Finally the segments were integrated into a single major river, the Ohio. Tremendous amounts of meltwater, liberally laced with sand and gravel, cut a deep bedrock channel to depths well below the present stream level.

When the amount of meltwater from the last great glacier lessened, much of the sand and gravel it carried was dumped in the Ohio River Valley, gradually filling it to a level somewhat above that of the present Ohio. Laughery Creek at that time flowed into the Southward-flowing Ohio that had replaced the Northward-flowing preglacial Kentucky River.

As the Ohio Valley was filled with sand and gravel, Laughery was blocked at its mouth, thus causing a lake to form in the lower end of the valley. The sediment that Laughery carried gradually filled the lake, so that the creek eventually flowed across the fill. At present it and the Ohio are actively eroding again, cutting through the earlier valley fill.

Being able to determine this much of the story of the lower part of Laughery Creek still doesn't explain why the segment flowing through the Park and Ripley County is at such an odd angle to the lower reaches of the Creek.

No evidence has been found yet that there were two separate streams that were united by what is called *stream capture* or *piracy*. To use Laughery Creek as an example, the lower part of the present stream might have been lengthening itself by erosion. Thus as it progressively cut back it intersected another stream that then became the upper segment of Laughery.

Another possibility is that perhaps the front of the ice once stood in a position now marked approximately by the upper segment of the stream which developed along the ice margin.

Or could there have been a great crevasse extending back into the ice mass through which water flowed to carve a course on the rock surface? The puzzle remains unsolved, and this is the second mystery of Laughery Creek. The answer can be revealed only by further geologic study.

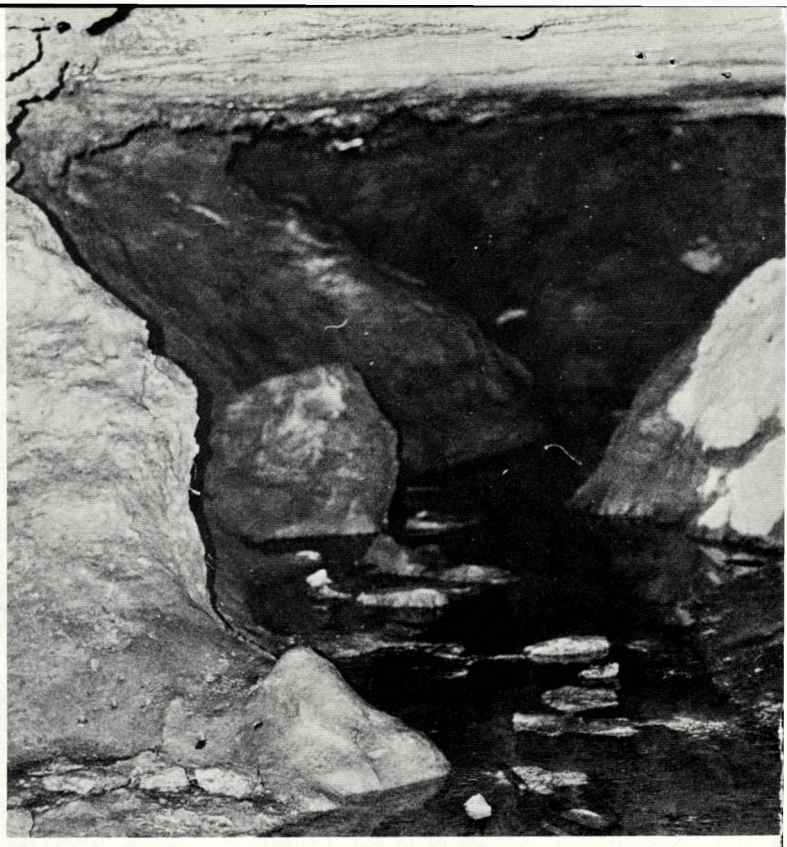
Peaceful Laughery Creek Below the Dam.

We can say that the stream valley had several cycles of activity related to the ebb and flow of repeated intervals of Continental glaciation. This is recognized mainly by the terraces *(Qsi)* found along its course as shown on the geologic map on Page 6. The stream in its latest meanderings on the earlier fill has gradually eroded through to establish its own course on bedrock.

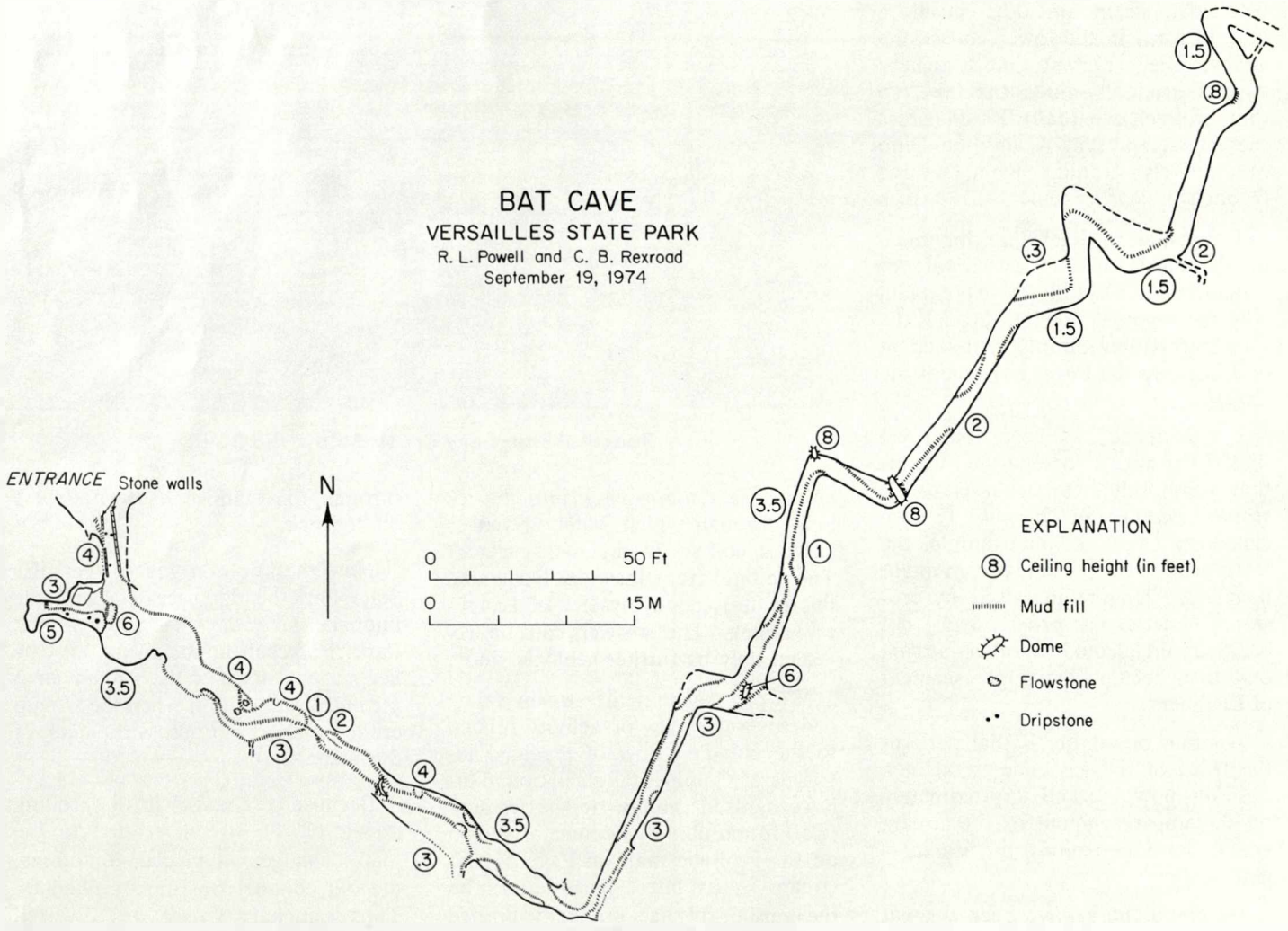
Note the knob on which Versailles State Park headquarters sits and the knob in the valley just South of the Park. For each knob, during an earlier stage, a loop of the stream, or a *meander,* was cut off when the stream eroded a short cut across the neck of the meander.

Because of changes in the eroding power of the stream related to the many changes in glacial conditions, the old channel was mostly filled in. Thus Laughery Creek was diverted

Dripstone Pillars and Stalagmites in the Main Room of Bat Cave.



A Passage in Bat Cave, One of Indiana's Lesser Known Caverns.



back to the looping course around the Park headquarters hill, but not back around the Southern hill where the half circle of fill (*Qsi* on the geologic map) shows the abandoned course.

Bat Cave is one of the most interesting geologic features of the Park. It and the other subterranean drainage features have been left for last.

Bat Cave is easily accessible a short distance Northeast of the Park campground on a point on the South bluff of Falling Timber Creek. In 1916 it was owned by Dr. Jim Sales of Dillsboro and so is also known as Jim Sales Cave. He was responsible for the rock wall along the entry passage.

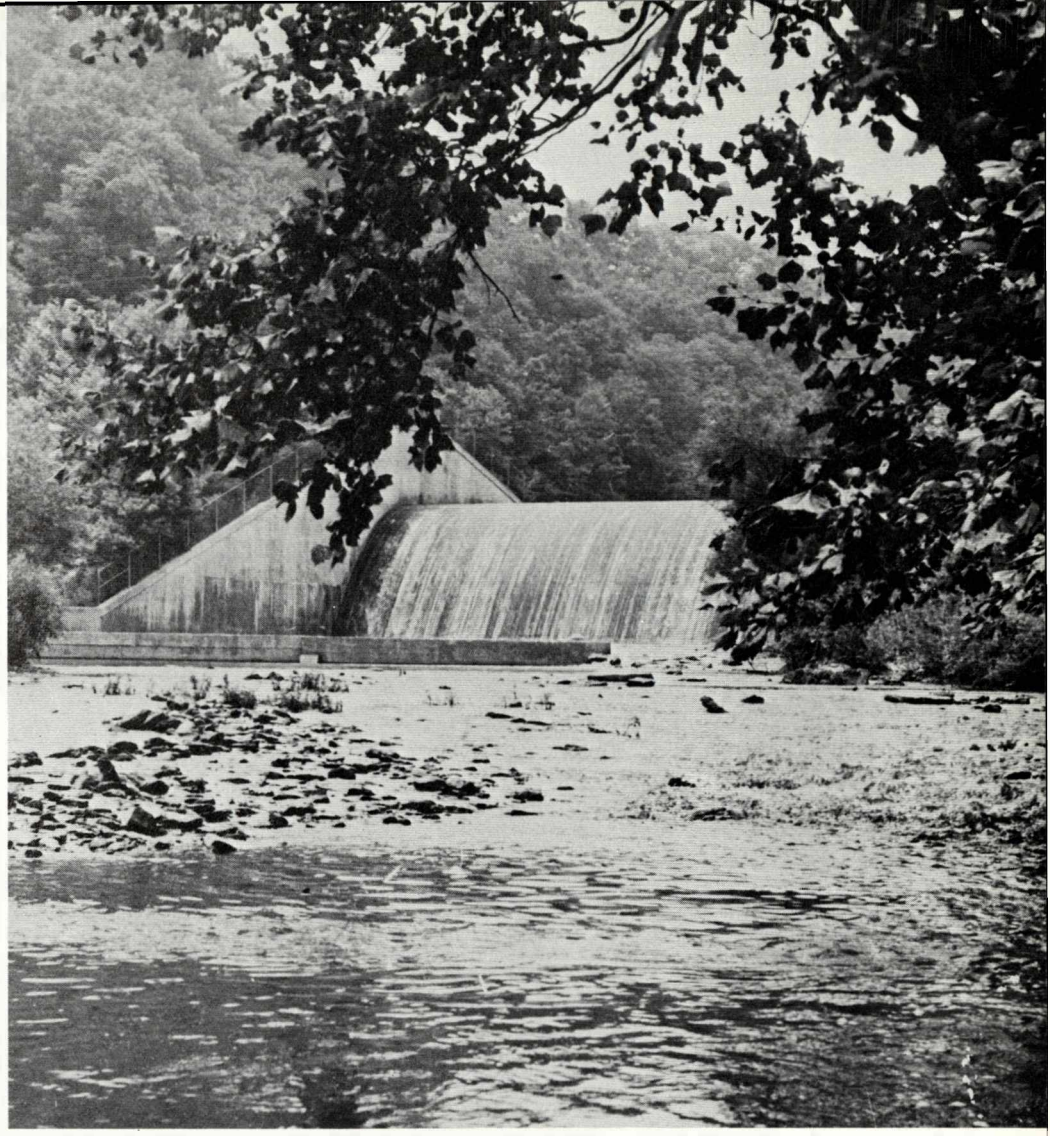
We know that Bat Cave is more than 437 feet long, for it has been mapped that far and extends as a very low passage beyond that point. The map on Page 10 shows the configuration of the Cave and also shows that a description of the Cave in the *Indiana Academy of Sciences Proceedings for 1916* was not completely accurate. This description stated that one passage extends about 30 feet to the right from the main room and another passage 70 feet long extends toward the left and terminates in a spring.

Admittedly, the ceiling is rather low at the point of supposed termination at the "spring." But hundreds on hundreds of people have crawled beneath the low spot to emerge into a larger continuation of the passage.

Although Indiana Academy's writer in 1916 did not appreciate the full length of the Cave, he greatly exaggerated in stating that the tallest man could walk freely in the main room. Likewise, stalactites, stalagmites and pillars are still in the cave, but not in the profusion you might expect from the earlier description.

Bat Cave is similar in form and origin to other solution caves formed in limestone. This cave is in limestone of *Ordovician Age* belonging in the *Whitewater Formation.*

Rainwater percolating through the soil becomes a weak acid before it works its way into bedrock under the force of gravity. Any tiny opening in the rock becomes an avenue of move-



Laughery Creek and the Versailles Lake Dam.

ment, and the solvent action of the ground water along the openings in the more soluble beds of rock enlarges them, further concentrating the movement of the ground water.

Thus the passages of most caves are aligned along joints. The map shows that this is true for Bat Cave. Greater solution may occur where joints intersect, and this is illustrated by the small domes at several angles in the passage. These are the only spots in the cave where a six-footer can stand up.

Bat Cave apparently had several episodes in its formation. The first encompassed the time when the cave passage was dissolved within the bedrock.

Later, probably during a glacial stage, the cave was nearly choked by mud, for parts of the main passage have flowstone-covered mud walls instead of rock walls. The twists and turns of the cave suggest the possibility, at least, that passages completely filled with mud remain camouflaged behind the mud banks.

Although the mud has been cleared from much of the cave in later activity, insoluble *chert* remains behind, concentrated on the floor as sharp-edged gravel that does little for the comfort of your knees while you are crawling through the upstream stretches of the cave.

Numerous sinkholes at the surface in the Park further testify to the dissolving power of ground water. Many are found near the lookout tower. Much of the rainwater is channeled into these depressions that commonly are located at the intersection of joints where initiation of infiltration and solution was most favorable. The initial openings gradually enlarged to form funnel-shaped depressions that

This Covered Bridge Is on the Original Route of the Cincinnati-to-St. Louis Pike Across Southern Indiana. The Road Has Been Rerouted as U.S. Highway 50 and the Bridge and Old Roadway Are Now in Versailles State Park.

start the water on its subterranean journey. Some of the water returns to the surface in the form of springs only a short distance below the sinkholes.

In addition to the sinkholes near the lookout tower, a few are near Bat Cave, and are on the hill just North of Falling Timber Creek across from Bat Cave. Still other holes are on the hills on the West and East sides of Laughery Creek as it flows South of U.S. Highway 50.

Cave Hill Road runs along the latter area, and its name suggests that there might be other caves in the Versailles area.

The greatest concentration of caves and sinkholes in Indiana is in the limestone terrain of *Mississippian Age* in South-Central Indiana. But these solution features can be formed wherever the bedrock is limestone, as is shown in Versailles State Park.

An understanding of the variety of interesting geologic features there will add to the pleasure of your next visit to Versailles State Park. The 230-acre Versailles Lake attracts huge numbers of swimmers, boaters and fishermen.

Hiking and bridle trails (a saddle barn with riding horses for rent is in the Park) not only display the geology but lead through native forest that includes fine specimens of Oak, Hickory, Tulip, Beech, Maple, Black Walnut and other Hoosier species. Two Dedicated Forest areas are included within the Park.

Wildlife abounds, and deer and other game commonly are seen at night crossing the roads or moving along the edges of the picnic areas or campgrounds. The rarity is the bat. However, a Park Naturalist once reported seeing a bat in the cave, and so its name.

Of course, birds are numerous in the Park. It is a real thrill to see a great blue heron wading in Laughery Creek below the dam. [See *Outdoor Indiana,* May, 1973.]

If you time your visit to coincide with Versailles' annual Pumpkin Festival, be sure to leave the Park by Busching Covered Bridge and drive up the bluff of Laughery Creek into town. [This is the original route of the Cincinnati-to-St. Louis Pike across Southern Indiana. It has been straightened a bit and is now designated as U.S. Highway 50. See *Outdoor Indiana,* July, 1972.]

While in town visit Tyson United Methodist Church, a modernistic architectural showplace completed in 1937. And during travel season, the Ripley Couny Historical Museum is open with its interesting displays. In May, August or October make a short drive between Versailles and Friendship, headquarters for the National Muzzle Loading Rifle Association, for one of the three annual matches.

History and Nature combine in Ripley County to provide a striking setting for Versailles State Park.

General

Parks (In)-State

Park attendance increases in 1987

Sullivan Daily

By JOHN FRITZ
Times Staff Writer

1/29/88

Record numbers of people visited Indiana Department of Natural Resources parks and other properties in 1987, helping boost the state park system's income nearly $2 million from 1986, officials said.

It also was a record-setting year for DNR and other recreation and wildlife areas in Sullivan County, according to figures provided by local property managers.

Attendance at Minnehaha Fish and Wildlife Area climbed 35 percent, from 42,872 visitors in 1986 to 57,838 in 1987, according to DNR.

And at nearby Shakamak State Park, straddling the boundaries of Sullivan, Greene and Clay counties, attendance rose 8 percent during the same period, from 253,000 to 274,000. The park recorded a similar increase in its yearly revenues, climbing about 14 percent from 1986 to 1987. Shakamak collected $216,060 in 1986, while the figure jumped to $246,842 for the year ending 1987, according to DNR.

Attendance figures are not kept at Greene—Sullivan State Forest. But DNR estimates a 2,000 to 3,000 increase in attendance during the one-year period, said David Sutherlin, DNR public information officer.

In 1986, 13,000 to 17,000 people visited Greene—Sullivan. In 1987 an estimated 15,000 to 20,000 people used the facility, DNR estimates.

Meanwhile, revenue at Greene-Sullivan skyrocketed dramatically, increasing from $285,489 in 1986 to $524,770 in 1987. The jump is because of increased coal royalties paid by Peabody Coal Company which is mining on Greene—Sullivan property, said Property Manager Curt Todd.

The coal company is strip mining in the Twin Lakes and Andis Lake areas, Todd said.

Coal royalties for 1987 totaled $497,319, as compared to royalties of $266,212 in 1986, Todd said. Revenue from the sale of park timber also increased, he said, advancing from $7,691 in 1986 to $14,230 in 1987.

Meanwhile, Sullivan County Park and Lake reported the park's highest revenue on record, $229,200 in 1987. The figure is up from 1986 revenue of $211,300, and is well above the $39,000 collected the first year the park opened, in 1969.

The park sold 1,779 annual gate passes, while 15,952 cars passed through the park's gates after paying a daily fee. A total of 760 walk-in or bus fees also were collected.

Complete records for Turtle Creek Fish and Wildlife Area in western Sullivan County were not available. But Hoosier Energy, which recently took over operation of the man-made lake and hunting land, reported 5,000 fishermen and 1,600 hunters passed through the area's gates during the last four months of 1987.